On the Spatial Units of the Hoysala Temples
A Study of Spatial Composition of the Hoysala Temples

Naomichi YAGUCHI

Abstract

In this paper, I aim to clear the concept of special units of the temple architecture in India. It is important to define the meaning of the spatial units of the temple architecture. Though the temples amplify all over India, the spatial units, i.e., garbhagrha (sanctum), sukanasi (vestibule), navaranga (closed hall of worship), and mukhacatuski (pillared entrance hall) and so on, are not uniform. Take the Hoysalas for instance, I try to clear the meaning of the special units, what is universal character and what is particular character of the Hoysalas. This paper is based on the research under the grant for scientific research by the government of Japan.

Keywords : Indian Temple Architecture, Hoysalas, Garbhagrha, Sukanasi, Navaranga

Introduction

Since the death of King Harsa Vardhana, many dynasties were enumerated in the various Indian medieval histories. After the 11th century, numerous architectural styles, mainly named after the dynasties, were found throughout the Indian continent. Though these dynastic styles have individual characters, various architectural and sculptural expressions show many similarities, reflecting very similar conceptions. The masonry temples dated from the 4th or 5th century and their progeny, found over the continent by the 7th century, often are quite different from any other forms of religious architecture throughout the world. In the architectural history of India, the evolution of the styles involved a conscious reflection and transformation from the precious dynastic styles, with significant reference to political and religious needs. One such dynastic styles is that of the Hoysalas in lower Karnataka. In this paper, I shall discuss the Hoysala temples, concerning especially upon the usage and meaning of the space.

It is important to define the meaning of the spatial units of the temple architecture. Though the temples amplify all over India, the spatial units, i.e., garbhagrha (sanctum), sukanasi (vestibule), navaranga (closed hall of worship), and mukhacatuski (pillared entrance hall) and so on, are not uniform. Take the Hoysalas for instance, I try to clear the meaning of the special units, what is universal character and what is particular character of the Hoysalas. I shall start from stating the historical background and general features of the Hoysala temples, then discuss about the meaning and usage of the space unit of the temples.

This paper is based on the research under the grant for scientific research by the government of Japan .

Historical and Religious Back Ground

The origin of the Hoysalas is not clear. It is only capable to believe that they were from a hilly area. The legend associates an ancestor 'Poysala' or 'Hoysala' with killing a tiger at the command of his preceptor in the precincts of the temple at Angadi, the hilly town of Lower Karnataka.

The Hoysala history takes up a concrete shape from Nrpakama (or Nrpa Kama). His capital was Sosavur, present Angadi, located in the heavily wooded hills. The chief was mentioned in an epigraph of A.D. 1006 in the western part of lower Karnataka. He was the first noble of the dynasty who had stated expanding the territory of his principality and in the process had had an encounter with the Cola dynasty of Tamil. His rule may have ended some year before 1047 when his son Vinayaditya is for the first time emerged in the epigraph stated to have engaged the Hoysala throne. Hoysala Mahadevi, a consort of Calukya Somesvara I, may have been Nrpakama's daughter. The Hoysalas were thought as a feudatory of Later Calukyas.

Vinayaditya, who had shifted his capital to the plains in Belur, had a long rule. He succeeded in expanding his power over western part of Gangavadi, present lower Karnataka, and expedited his son, Ereyanga to the coast of Bengal Bay. The Hoysalas watched for a chance two empires, Later Calukyas of Kalyani and Great Colas of Tanjavur were conflicted at lower Karnataka.

On the Spatial Units of the Hoysala TemplesA Study of Spatial Composition of the Hoysala Temples

Ereyanga succeeded Vinayaditya in 1098A.D. but may have been fairly advanced in age and thereafter ruled only two years. His elder son Ballala I then ascended the throne. At the time of Ballala I, the Hoysala political expediency took a different roll. He deviated from the family's earlier policy of loyalty to the Calukya emperor and sought independence by steadily building up power. He had died issueless, and was succeeded by his younger brother Visnuvardhana in 1108 A.D..

In Visnuvardhana's time, the Hoysalas has got a royal status. By 1116 A.D. the Cola resistance at the boarder had been completely crushed and the whole of lower Karnataka was brought under the Hoysala control. Visnuvardhana is said to have proceeded as far as Kanci, one of the most sacred city in Tamil, in the last leg of this campaign. After defeating the Cola vassals and Pandyas of Uccangi, he proceeded to the main land of Calukyas. In a following few years, he defeated Calukyan generals on the way to Gadag, one of the most important cities in Belvola region, present central Karnataka. By 1133 A.D., he not only made a new capital, Dorasamudra, but accepted the suzerainty of Calukyan king, Vikramaditya IV. He had embraced Vaisnavism of the Srivaisnava sect of Sri Ramanujacarya and had given a powerful impetus to Visnu worship by constructing splendid edifices for Visnu in his home land.

In the time of Narasimha I, son of Visnuvardhana, from 1152 to 73 A.D., the Hoysala power was to decline. He lost mainly the northern part of his territory. But like his father, Narasimha I was interested architectural projects. He had patronized Brahmanism as well as Jainism by giving grants as proven by many epigraphs.

Ballala II, Grandson of Visnuvardhana, made the Hoysalas reached the zenith of power and political glory. Ballala II, ruled from 1173 to 1220 A.D., had started his carrier with rebellion against his father, Narasimha I. In his northern territory, the Hoysalas were up against kalacuris who deteriorate Calukyas into chaos, the Seunas of Devagiri, and the Kakatiyas of Warangal. Though the last Calukyan king, Somesvara IV, seemed to recover the imperial power, force Kalacuris back. But declined Calukyas were captured their capital by Ballala II in 1195 A.D., disappeared from the history in 1215 A.D.. Meanwhile Ballala II declared independence from Calukyas in 1192 A.D., and established a new era. After the disruption of the Calukyas, the Hoysalas conflicted with the Yadavas in their northern end. To provide increasing war cost in the north, Ballala II paid attention to the south. In 1218 A.D., the Colas

wished the Hoysalas to extend their assistance in the conflict with the Pandyas. With this as a turning point, the Hoysalas got involved with Tamil region.

Narasimha II, succeeded his father, Ballala II in 1220 A.D., got more deeply involved because of his son's marriage to Cola's princess. Meanwhile the Seunas, a feudatory of the Hoysalas, attacked the Hoysala capital, Dorasamudra, but Narasimha I could get rid of them. Despite he lost some territory in north the Hoysalas gained new territory in Tamil, the Hoysalas reached maximum range of their territory.

Since their vast kingdom could not be controlled from a single center, Somesvara, the son of Narasimha I, established a separate capital for Tamil region at Kannanur, near present Srirangam. Against Somesvara who remained in Tamil, his vassal started to establish their own demesne in Karnataka, the Hoysala dynasty started to decline. After the death of Somesvara, the territory of the Hoysalas was apportioned the responsibility of the state between Somesvara's two sons. Accordingly, Narasimha III succeeded to the throne at Dorasamudra, while Ramanatha sat on the throne at Kannanur. The partition of the Hoysala Kingdom only led to fights between the two step brothers. Taking advantage of the situation, the Seunas invaded Narasimha's territory again and again.

After Narasimha III, Ballala III reintegrated the kingdom, but his territory was invaded by not only the Kakatiyas and the Seunas but Delhi Sultan. At last he escaped from Karnataka to Tamil.

By 1346 A.D., his successor Ballala IV's territories were engulfed in the newly founded Vijayanagar kingdom by the Sankam brothers.

In a regnal period of the lings from Narasimha I down to his successors till the end of 13th century, temple architecture had received great support and momentum by the generals, ministers, merchants and so on. The chiefs and kings had been, as usual, giving grants to the religious foundation. In lower Karnataka, Hinduism, i.e., Saivism and next to it Vaisnavism had been the dominant religions for which the largest number of temples had been built. A number of grants were made by royalty, nobility, and mercantile community to these foundations.

Buddhism, on the other hand, had no record in this region, Jainism had flourished vigorously and had been generously supported until at least the time of Ballala II by the royal house as also by many Jaina generals, tradesmen, and by town and

city burghers, most of whom were Jaina by persuasion. According to Jaina tradition, the Hoysala chiefs before Visnuvardhana more or less were votaries of Jainism. But in 13th century, the numbers of donations as well as new constructions of temples were reduced; Jaina religion was taken over by Vaisnavism and Saivism.

As far as Vaisnavism is concerned, it is said to be introduced to the lower Karnataka by the Colas, in the late 10th and early 11th century, and it had remained confined to some villages near the boarder with Tamil until Visnuvardhana Hoysala brought Vaisnavism into the heartland of Hoysalas. According to the tradition, Vaisnavism was spread with Visnuvardhana's religious conversion as the turning point. Visnuvardhana is believed to be converted from Jainism into Vaisnavism. This is believed to have done by Ramanujacarya, who was the first Indian philosopher to provide a systematic theistic interpretation of the philosophy of the Vedas, and is famous for arguing for the epistemic and stereological significance of Bhakti, or devotion to a personal God. Therefore his thought was quite different from conventional Upanishads. Visnuvardhana is believed to have consecrated five Vaisnavism temples to commemorate the conquest over the Colas in 1116, after his conversion. Vaisnavism continued to thrive with mullah Ramanujacarya and under new political power the Hoysalas.

When the Hoysalas entered the political scene in about the middle of 11th century, more than the half of the articulate society was formed of Saivas. The Hoysala Saivas were governed by the codes of their Paspata, Laklisa and Kalamukha sects, with the Kapalikas on the one hand and the Virasaivas on the other hands. The first three sects had filtered down to the grass-root level, controlling almost all of agriculturalists, traders, craftsmen, warriors and sizable section of the middle classed bureaucrats.

It is important to understand the difference between religions, i.e., Vaisnavism, Saivism and Jainism; I shall start with the difference of naming.

Naming temples and religious settlements either after the patrons or after their relatives and masters was a common mediaeval practice, but it was more popular among the Saivas than among others. Lots of Siva temples bore the names of their patrons, their relatives, masters, teachers, villages, tanks and of their communities, while as many as these stood unnamed too. Though Jainas also took recourse to a similar way the Vaisnavas of the Hoysala kingdom generally avoided

this practice and named their temples after their gods, in partial modification of the convention established by the Colas. However, they named their religious settlements as often after their patrons as after their gods.

The second is the placement of the temples in the settlements. Under the Hoysala dynasty, it is established settlements by the Brahmins, called Agrahara. This is one of the reason why the strong kingdom was made in lower Karnataka where less populated. The Agrahara was a generic name of established settlements; in fact, Sivapura for the Saivas, Agrahara for the Vaisnavas and Jinaraya for the Jainas respectively. In the newly established Agrahara, temples were built, not only of dominant religion but others, though the main temple had inclination to be built at the center of the settlement. Under the Hoysalas, the images of Siva or Visnu were sculptured on the wall of temples of both religions. It is assumed that there must have been tolerant of other religions.

The third is the patronage of the temple as well as the settlements. The members of the Hoysala royal family were not belonging the same religion. The case of King Visnuvardhana is a notable example. He himself was converted from Jainism to Vaisnavism. His queen, Santaladevi and her mother were believers of Jainism. His father, Ereyanga was a Saiva, and his son, Narasimha I was Vaisnava. He provided grants not only for related Vaisnavas and Jainas but Saivas. He founded Chennakesava temple at Belur in 1117A.D. as the center of the Vaisnavism and Hoysalesvara temple at Dorasamudra, present Halebidu in c. 1120 A.D. as the center of the Saivism. This shows again the tolerance of other religions, and ruler's thought to make empire stable and to be supported by most of people.

The fourth and the last is the artists who were in charge of the construction of the temple. On the wall of the temple left the name of guild consisted of architects or sculptors . Apart from general stylistic concerns, this is the most important feature of Hoysala architecture. According to Collyer, their religions are clear. Almost all of them were Saivas, because the Kalamukha sect is dominant where the guild was active. Saivas were responsible for the construction of all kind of temples.

General features of the Hoysala temple Architecture

The architectural style of Hoysalas has been confused with that of later Calukyas. In fact, this style of lower Karnataka is closely related to the style of upper Karnataka. But even the first notable Hoysala foundations such as Chennakesava

temple at Belur, Hoysalesvara temple at Halebidu were relatively later in founding, with hardly any significant earlier constructions of upper Karnataka. Along with the architecture of the Kakatiyas in northern Andhra Pradesh, that of Hoysalas represents the end of a tradition, which is able to be called Deccani, i.e., the name of the regional style. Hoysala heartland lies south of the traditional definition of this area whose southern boundary is Krsna-Tungabhadra River. After the fall of the Hoysalas and the Kakatiyas, the Vijayanagara Empire gained control of all of southern India. They did not follow Deccani style, instead followed the Dravidian style originated in Tamil.

The temples build during Hoysala rule fall into two broad groups; (A) large, ornate and complex structures, fully developed by Hoysala artists; (B) small, less ornate and relatively simple structures, sharing some characters with later Calukya temples. Though many scholars identified the Hoysala style of architecture looking at the temples of group (A), those are not all of the temples built under Hoysala rule.

The remarkable characters of the first group (A) are as follows;

1. The temple is raised on a platform which takes on the contour of the temple itself. All the stellate angles of the vimana would have consistently continued from the bottom of the platform to the top of the superstructure.

2. The entrances are partially screened by the use of the hall wall. This type of half wall which screens the area between columns of an entrance is called jagati.

3. The adhisthana of vimana and that of navaranga are covered with continuous friezes, which sometimes continue the entire temple around.

4. The band of large figural sculptures depicting gods and goddess along with male and female attendants are placed above the adhisthana friezes on the wall of vimana and navaranga.

5. Above this figural band are placed architectural decoration, which is the shape of superstructure supported by thin pilasters besides figural sculptures. This forms the false second story.

6. The pillars in the navaranga and sabhamandapa and the dwalf pillars of mukhacatuski are mainly srikara type. They are, in fact, the round shafted pillars based on architectural tradition. They have been called 'lathe turned' due to the high precision of the carving of their round surfaces. But there are not only no evidence of actual use of the lathe, but there are sometimes chisel marks toward the center of the pillar.

The characters of the second group (B) are as follows;

1. Exceptionally platform is made for the temple of this group . This feature is different from either temples of group (A), or those of later Calukyas.

2. The jagati is used, although in many instances, the entrance to the temple is into a solid wall of the navaranga.

3. The moldings of adhisthana are not flat in profile, usually used Kapotabandha or the adhisthana using kapota topping above the prati-kantha molding.

4. There is a band of figures above the adhisthana moldings, but the figures are usually more widely gapped than group (A).

5. There is no false story on the wall, as in temples of later Calukyas. The difference of the wall between Hoysalas and later Calukyas is the existence of the figural sculptures.

6. The pillars are quite similar to those of group (A).

Spatial Units of the Hoysala Temples

In the Hoysala temples, the interior of the temple can be divided into certain units, i.e., chambers. The Hoysala temple is basically composed of the garbhagrha (sanctum), the sukanasi (vestibule), the navaranga (closed hall of worship), and the mukhacatuski (pillared entrance hall). It is worth to identify those individual spaces for further study, which basically depends on this definition of the spaces.

Those units are basically square planed spaces with different functions. Though separated by the wooden door usually, the interior of the temple occasionally had no doors in-between two units. Those two units can be divided by the differences of the size of the space.

One of the general features of the Hoysala temples is the smallness of the structure. This is basically dependent on the quality of the materials which is used for the temples. The stone mine around lower Karnataka has been chloritic schist, so-called soap stone. This blackish stone is quite soft which is used mainly for the decorative stone laminate, and can not be counted on shearing force. It means that it is quite difficult to make long beams to build huge structures. This weakness of stone seems to be the main reason why the Hoysala temples are quite small and lavishly ornate with detailed sculptures.

Garbhagrha

The basic unit of the Hoysala temple is the garbhagrha. This can consist of the temple alone, can be thought a smallest spatial unit in the temple to define the size of the space. This is a square planned chamber that does not have any opening except the doorway. Covered by thick walls, it is crowned by a

superstructure called the sikhara. The garbhagrha and the sikhara compose the vimana or the mulaprasada. This is usually identified as Meru Mountain or Kailasa Mountain. The former is the representation of the Indian cosmology and the latter is the residence of Siva. In the garbhagrha as if which is dug in this mountain, the religious object is enshrined. As indicated by the name, garbha (womb), grha (house), this is identified as the inner space of the womb.

While the outside walls of the vimana reveal a decorative expression in both architectural and sculptural terms, the inside walls do not. We may find the thin pilasters at the sides and the combination of the square and triangle parts of the ceiling. It seems that the outside walls were planned to attract the attention of devotees by expressing the importance of the structure. This is the design for the public. The inside is a sacred space separated from human activities. The ornamentation is sparse except pilasters in some temples, allowing the devotees' attention to be focused on the image. The garbhagrha of each temple is a sanctified space in the temple as well recognized as a center of the world.

The temple is recognized as the center of the world, the garbhagrha is where the image is placed and religious center of each temple.

Sukanasi

The sukanasi, the space between the garbhagrha and the navaranga, is a small thick walled chamber without windows, its open doorways leading to the garbhagrha and the navaranga. The doorway to the garbhagrha is usually closed with the wooden doors, while that to the navaranga is not. Some of them are closed with the double-swinging wooden door at the center and perforated windows at the side, others are open or no wall at all.

The sukanasi, identified with the antarala, is the same size as the garbhagrha. The term sukanasi is derived from the sukanasa, the projecting portion in front of the sikhara. The superstructure is composed of the sikhara and the sukanasa; usually the Hoysala temples do not have any other superstructure. On the sukanasa, a unique crest, commonly used for the Hoysala temples, shows the legendary founder of the Hoysalas, Sala, killing a tiger who threatened an ascetic.

The design of the ceiling is as simple as that of the garbhagrha. Qualified priests were allowed to go inside; the devotees were controlled to look inside through the doorway. Inside the sukanasi it is kept the small image which is conveyed on the

ratha (chariot) at the time of the festival. This sukanasa is called antarala in general, which means 'intermediate space' between the sacred and secular spaces. The sukanasi may be identified a sacred space next to the garbhagrha.

The vaulted superstructure, Sukanasa is one of the distinct features of the Hoysala temples. The vaulted roof is lower than the Sikhara which is the highest peak of the temple. The Sukanasa is attached to the Sikhara, compose the Vimana. It is conceivable that Sikhara and Sukanasa are composing one structure which can be identified as a symbol of the temple. As the view of the temple is emphasized by the superstructure as well as vaulted roof in front, it seems reasonable to suppose that the spatial character of the Sukanasi also very close to that of the garbhagrha, the most sacred space in the temple. Since it was impossible for ordinary men to go in, I would rather to say that we can distinguish the inner space of the temple between the sukanasi and navaranga in the sense that there is a clear distinction between both spaces; sacred or not; the ordinary men can go in or not.

Navaranga

One of the major characteristics of mediaeval Indian architecture is its two-dimensional planning, many of the subtleties of architectural details being found in the ground plan. Though the relation between spatial elements and associated sculptures are determined by texts like the Vastu-sastra, it is not clear which text the Hoysala architects followed. In the Hoysala temples, and the Hindu temples in general, quite in contrast to the Christian cathedrals or the Islamic mosques, huge interior spaces were neither planned nor intended. They are trabeated structures in which small spaces defined by pillars and beams are repeatedly used. The small spaces separated by beams can be thought as a minimum defining unit of the space. These are adjoining spaces of the same size as the garbhagrha, and are called ankana in the Hoysala architecture. The navaranga, generally referred to as the mandapa in Hindu temples, is a hall (ranga) divided into nine (nava) sections.

The central section of the navaranga is generally bigger than the others and slightly raised, the latter feature being a particularly notable characteristic of the Hoysala temples. This is the place for singing and dancing in honor of gods.

On the other side of the garbhagrha in the navaranga, stone benches, probably used as seats for the audience, can be seen. The walls have jalakas, latticed windows, for allowing light to

enter the navaranga. Though the Hoysalas basically followed the previous open halls that were common in temples of Later Calukyas of Kalyani, these half pillars of the open halls were walled up in some of the Hoysala temples.

The elaborate decoration of the ceilings of the navaranga is another feature of the Hoysala temples. As we discussed above, the decoration of the ceilings is different each other. Usually the central one is most elaborate.

The pilasters of the navaranga are usually classified into two; the ornate and less-ornate. The ornate pilasters have many facets and placed on the axis to the garbhagrha. These are usually placed one pair on the side of the garbhagrha or sukanasi, and the other on the side of the main entrance. The less ornate pilasters are placed on the plain wall. Obviously the way to other spatial units was more ornate than plain walls.

Mukhacatuski

The mukhacatuski, the entrance hall to the inside of the temple is recognized as an intermediate space between outer and inner space of the temple. This can be situated at the east of the temple while the garbhagrha is on the west. This is not only the case that the mukhacatuski situated. In some of the temple, while the garbhagrha is situated at the west, the mukhacatuski can be situated on the south as well as on the three sides of the navaranga except on the west. Though I will describe the variations in the chapter 3, I like to mention here that the entrances to the temple are not only one place but can be several directions if the situation allowed.

The wall of mukhacatuski is composed with base, railing and dwarf pillars. The profile of dwarf pillars is quite similar to pillars in the navaranga.

Sabhamandapa

In front of the mukhacatuski is placed the sabhamandapa. This is thought as one of the main feature of Later Calukya and Hoysala temple architecture. Without any doubt its design was born by increasing the size of the porch and in the eleventh and twelfth century the open hall became an independent and sumptuous part of many temples built in Central Karnatak'. The sabhamandapa is attached to the entrance porch, as well can be detached. The open hall is cruciform, has no image inside.

Conclusion

The garbhagrha is a center of the temple as well as the center of

the 'space'. The temple is composed with the garbhagrha as a center. Towards the garbhagrha, there are two partitions, i.e., sacred or not at the entrance of the sukanasi, and walled up inside or semi-open outside at the entrance of navaranga. The ornamentation of the units has the inclination to be plain from outside to inside, the brightness as well.

The space of the Hoysala temples can be divided into certain units which have certain importance as well as functions, such as the garbhagrha, the sukanasi, navaranga and mukhacatuski.

Notes

15   B

15760482

This chapter is based on the following references.
Setter, S., *The Hoysala Temples* (2 vols.) 1992, Bangalore, Kala Yatra Publications
M.A. Dhaky, *Encyclopaedia of Indian Temple Architecture South India Upper Dravidadesa Later Phase, A.D. 973-1326*, American Institute of Indian Studies, Indira Ghandi National Center for the Arts, 1996, New Delhi, Pradeep Mehendiratta
Collyer, Kelleson, *The Hoysala Artists - Their Identity and Styles,* 1990, Mysore, Director, Archaeology and museum, Mysore
Manickam, V., *Hoysala Ballala III and Kongu*, Quarterly Journal of Mythic Society vol.78, 1987, Bangalore
    The most famous architect-sculptor of Hoysala temples is Mallitamma. His first signature was found at Amritapura in Tarikere taluk in 1196 A.D, though his last signature was found at Somanathapura in 1268. As it seems impossible to work for 72 years, the name of Mallitamma assumed to be the name of guild.
    This chapter is based on the following references.
Setter, S., *op. cit.*
Setter, S., *The Hoysala style of Temple Architecture and Sculpture, XIth to XIVth Centuries*, Ph.D. Dissertation, Cambridge, 1970 (unpublished).
M.A. Dhaky, *op. cit.*
Brown, Percy, *Indian Architecture (Buddhist and Hindu Period)*, reprint, 1956, Bombay, D.B.Taraporevala Sons & Pvt.
    Annual Report of the Mysore Archaeological Department for the year 1929 - 1945-46, Bangalore, Government of Mysore
Foekema, Gerardus Maria Majella, *Hoysala Architecture, Medieval temples of Southern Karnataka built during Hoysala rule*, 1994, New Delhi, Books & Books
Del Bonta, Robert John, *The Hoysala Style: Architectural development and Artists, 12th and 13th Century, A.D.*, The University of Michigan, Ph.D., 1975.
    According to Del Bonta and Setter, the term 'lathe turned' was first mentiond by   Fergusson and Taylor. The original comment was that the pillars were as precise as they would have been had they been turned on a lathe. *Setter, The Hoysala Style…..*, pp.95-101, *Del Bonta, op. cit.*, p.121.
    The Viranarayana temple at Belur has the unmistakable platform, and   the Bucesvara temple at Koravangara may have had a platform, though if so , it is buried.
    This chapter is based on the following references.

，　506　　pp. 169　175,
1998　4　.

，　511　，pp.　201　　208,　1998　9　.

，　532　，pp. 255-262,
2000　6　.

Kramrisch, Stella, *The Hindu Temple* (2 Vols.), 1st, 1946, reprint, 1991, Delhi, Motilal Banarsidass

Foekema, Gerardus Maria Majella, *Calukya Architecture Medieval temples of northern Karnataka built during the rule of Calukya of Karyana and thereafter, AD 1000-1300*, 2003, New Delhi, Munshiram Manoharlal

Dhaky, M. A., *The Temple Forms in Karnata Inscriptions and Architecture,* 1977, New Delhi, Abhinav Publications

Setter, S., *op. cit.*

Foekema, Gerardus Maria Majella, op. cit.

M.A. Dhaky, *Encyclopaedia of Indian Temple Architecture South India Upper Dravidadesa Later Phase, A.D. 973-1326,* American Institute of Indian Studies, Indira Ghandi National Center for the Arts, 1996, New Delhi, Pradeep Mehendiratta

16　11　26